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RHIZOCTONIA ON BEANS

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Rhizoctonia solani Kuhn. is the name of a fungus that has caused considerable damage to bean crops in various ways. It is a soil-inhabiting parasite and often causes a rot of bean seed in the soil. It also attacks the stems, cotyledons and even the growing bud of the young seedlings before they emerge. On older plants up to blooming time, it causes very serious stem and root rot, which often kills the plants or injures them so that they remain stunted and do not produce any pods. On bearing plants the fungus often kills numerous leaves and infects most pods that contact the soil, causing brown lesions. When infected pods are packed in hampers with healthy beans and put in transit where the conditions are extremely favorable for growth of the fungus, it passes from the diseased pods to healthy ones and causes a disease known as "nesting". Considerable loss often results from nesting.

The fungus appears to be present in all cultivated soils in the state and is active over a wide range of moisture and temperature conditions. The disease has been found on beans in all parts of Florida and throughout the year. Plants grown during the cooler parts of the year are more subject to seedling blights and stem cankers, while root rots and pod decay are more often encountered during warmer, wet periods. The disease appears on all kinds of soil from light sand to heavy muck. However, it occurs less frequently on well-drained soils than on poorly-drained lands. Under favorable conditions, it will attack all of the commercial varieties of beans, producing similar symptoms, but varying with the age of the plant and the part of the plant attacked. This fungus also attacks most other cultivated vegetable plants with varying degrees of severity, causing such diseases as soil rot of tomato, also affecting branches and fruit, wire stem and bottom rot of cabbage and stem lesions of many others. It is one of Florida's most destructive diseases and one most difficult to control.

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SYMPTOMS

In a severe attack, little or no growth is made by the germinating seed before it becomes a moldy, dark-colored, mushy mass. When the seed is not prevented from germinating, large reddish-brown lesions may develop on the stem and girdle or partially girdle it. Smaller lesions also may develop on the small leaves and growing tip, often killing the seedling or preventing further growth. Lesions developing on stems above the soil surface may cause little or no trouble unless they are very deep. When half-grown plants are attacked, the invaded portions of the stem below the soil line show a tan or reddish-brown color. Occasionally the fungus invades and kills most of the roots, resulting in stunting the plant, a yellowing of the foliage, a drying of the lower stem which becomes reddish-brown, thin-walled and hollow. Plants thus affected die prematurely, turn brown and lose their leaves but remain standing.

When the fungus spreads to leaves that contact the soil, it causes them to appear scalded and lifeless and they eventually die and turn brown. The invaded area of pods that touch the soil becomes brown, which contrasts with the normal green or yellow color of the pod. The pod lesions may be few, small and shallow or large, irregular, brownish blotches that involve half of the pod in decay. Small pod lesions often are overlooked in the sorting and grading operations and when such infected pods are placed in hampers, the fungus develops rapidly and spreads to adjacent healthy pods and may cause considerable loss in a short time. Such a condition is known as nesting and is characterized by a white, fluffy growth of the fungus on and among the pods in the hampers.

CONTROL

Very little can be said in regard to the control of this disease. Seed treatment, sanitation, plant resistance and fungicides are of very little value. Rotation, if properly planned, may help in reducing the prevalence of the disease and drainage should be provided if needed in fields where beans are to be grown. Planting the seed on narrow-ridges or beds on low land improves the drainage around the plant and also reduces the chances of lower leaves and pods coming in contact with the soil. Following picking, the pods should be carefuly sorted and graded so as to remove all that are infected, thus preventing "nesting" in transit.